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## Tobacco taxation policy in three Baltic countries after the EU accession

Konstantin Krasovsky

**BACKGROUND:** Estonia, Latvia and Lithuania joined the EU in 2004 and had to increase tobacco excise rates. The aim of the paper is to explore the impact of tax policies on tobacco consumption, revenue and tobacco market in the Baltic countries.

**METHODS:** Data on tobacco sales, tax rates, prices, revenues, and smoking prevalence were taken from databases and reports. Tobacco affordability index was calculated using data on prices and GDP.

**RESULTS:** Tobacco taxation policy had three similar stages in Baltic countries: (1) In 2004-2007, tax rates increased slowly and cigarettes became more affordable in years of economic boom. Tobacco consumption and smuggling out of Baltic countries was on the rise, which caused increase of sales and revenues. (2) In 2008-2009, Baltic countries had to hike excise and VAT rates in years of economic recession, which caused sharp decline of cigarette affordability and resulted in large decline of consumption and sales and some excise revenue downfall in 2009-2010; however, all countries had higher revenues in 2010 than in 2007.

(3) In 2011, economic situation improved and tobacco sales and revenue increased.

The tobacco taxation policy in Baltic countries in 2004-2011 resulted in: (1) decline of total (licit + illicit) annual cigarette consumption by 30% both in Latvia and Lithuania, and by 10% in Estonia; (2) decline of daily smoking prevalence by 10-20%; (3) decline of the out-of-country smuggling; (4) almost no changes in volumes of smuggling into Lithuania and Estonia; (5) three-fold increase of the annual tobacco revenues in three countries combined.

**CONCLUSIONS:** Decrease of tobacco affordability caused by tax hikes and economic recession was the key factor of tobacco consumption decline. Tobacco tax hike is a win-win policy, while in years of economic boom it has more fiscal benefits and in years of economic recession it has more public health benefits.

**KEYWORDS:** tobacco; excise tax; Estonia; Latvia; Lithuania; Baltic countries; affordability; smoking prevalence; tobacco consumption; tobacco smuggling.

## Политика налогообложения табака в трех Балтийских странах после их присоединения к Европейскому Союзу

Константин Красовский

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**АКТУАЛЬНОСТЬ:** Латвия, Литва и Эстония присоединились к Европейскому Союзу в 2004 году, и это потребовало от них повышения акцизов на табак. Целью данной работы является анализ влияния налоговой политики на потребление табака, доходы бюджета и табачный рынок в Балтийских странах.

**МЕТОДЫ:** Данные о продажах табачных изделий, уровнях налогов, ценах, доходах и распространенности курения были взяты из баз данных и отчетов. Индекс ценовой доступности табака вычислялся с учетом цен и ВВП.

**РЕЗУЛЬТАТЫ:** Политика налогообложения табака имела три подобных стадии в Балтийских странах: (1) В 2004-2007 годах налоги увеличивались медленно, и на фоне экономического роста сигареты становились более доступными. Потребление табака и контрабанда из Балтийских стран возрастали, что приводило к росту

продаж и доходов бюджета. (2) В 2008-2009 годах, на фоне экономического кризиса, Балтийские страны были вынуждены резко повысить акцизы и НДС, что привело к резкому снижению доступности сигарет, их потребления и продаж, а также некоторому снижению акцизных поступлений в бюджет в 2009-2010 годах, хотя во всех странах эти поступления в 2010 году были выше, чем в 2007. (3) В 2011 году экономическая ситуация улучшилась, продажи табака и доходы бюджета возросли.

Политика налогообложения табака в Балтийских странах в 2004-2011 годах привела к следующим результатам: (1) общее (легальное и нелегальное) потребление сигарет сократилось на 30% в Латвии и Литве и на 10% в Эстонии; (2) распространенность ежедневного курения снизилась на 10-20%; (3) контрабанда сигарет из Балтийских стран сократилась; (4) уровни контрабанды сигарет в Литву и Эстонию почти не изменились; (5) ежегодные поступления в

бюджет от табачных акцизов для трех стран вместе взятых, выросли втрое.

**ЗАКЛЮЧЕНИЕ:** Снижение ценовой доступности табака, вызванное повышением налогов и экономической рецессией, стало ключевым фактором снижения потребления табака. Повышение табачных налогов является стратегией с двойной выгодой, при этом в годы экономического

роста преобладающими являются финансовые выгоды, а в годы экономического спада – выгоды для общественного здоровья.

**КЛЮЧЕВЫЕ СЛОВА:** табак; акцизный налог; Эстония; Латвия; Литва; Балтийские страны; ценовая доступность; распространенность курения; потребление табака; контрабанда табачных изделий.

## Політика оподаткування тютюну у трьох країнах Балтії після їх приєднання до Європейського Союзу

Костянтин Красовський

**АКТУАЛЬНІСТЬ:** Естонія, Латвія і Литва приєдналися до Європейського Союзу у 2004 році, що вимагало від них підвищення акцизів на тютюнові вироби. Метою цієї роботи є аналіз впливу політики оподаткування тютюну на його споживання, надходження до бюджету та ринок тютюнових виробів у країнах Балтії.

**МЕТОДИ:** Дані стосовно продажів тютюнових виробів, податків, цін, надходжень і поширеності куріння брали з баз даних та звітів. Індекс цінової доступності тютюну обчислювали з урахуванням цін та ВВП.

**РЕЗУЛЬТАТИ:** Політика оподаткування тютюну мала три подібні стадії у країнах Балтії:

(1) У 2004-2007 роках податки зростали повільно, і сигарети ставали доступнішими на тлі економічного зростання. Споживання тютюну та контрабанда з країн Балтії зростали, що призвело до росту продажів та надходжень до бюджету. (2) В 2008-2009 роках під час економічної кризи країни Балтії були змушені суттєво підвищити акцизи та ПДВ, що призвело до зниження цінової доступності сигарет, їх споживання та продажів, а також до деякого зниження акцизних надходжень у 2009-2010 роках. Але в усіх країнах ці надходження 2010 року перевищу-

вали такі 2007 року. (3) В 2011 році економічна ситуація покращилася, продажі тютюну та надходження до бюджету зросли.

Політика оподаткування тютюну в країнах Балтії в 2004-2011 роках призвела до таких результатів: (1) загальне (легальне та нелегальне) споживання сигарет скоротилося на 30% у Латвії й Литві та на 10% в Естонії; (2) поширеність щоденного куріння знизилася на 10-20%; (3) контрабанда сигарет з Балтійських країн зменшилася; (4) рівні контрабанди сигарет до Литви та Естонії майже не змінилися; (5) щорічні надходження від тютюнових акцизів до бюджетів трьох країн разом узятих, зросли втричі.

**ВИСНОВКИ:** Зниження цінової доступності тютюну внаслідок підвищення акцизів та економічної кризи є ключовим фактором зниження споживання тютюну. Підвищення тютюнових податків є стратегією з подвійною вигодою, причому в роки економічного зростання переважають фінансові вигоди, а в роки економічної кризи – вигоди для громадського здоров'я.

**КЛЮЧОВІ СЛОВА:** тютюн; акцизний податок; Естонія; Латвія; Литва; країни Балтії; цінова доступність; поширеність куріння; споживання тютюну; контрабанда тютюнових виробів.

## INTRODUCTION

Estonia, Latvia and Lithuania joined the European Union (EU) on May 1, 2004. This involved, among others, substantial changes in their tax systems. According to the EU Directive 2002/10, excise duties levied on cigarettes should account for at least 57% of the retail selling price, inclusive of all taxes, and, since July 2006, to be at least €64 per 1000 cigarettes for the cigarettes belonging to the most popular price category (MPPC). Under

their Acts of Accession, all three Baltic States were granted derogations to postpone the application of the minimum excise duties till 31 December 2009.

As of May 2004, the cigarette excise was just 12 euro in Latvia, 21 euro in Lithuania, and 26 euro in Estonia, so the excise rates increase should be rather high. Tax increase was not an initiative of local governments, but the EU requirement. These unprecedented increases

would not have happened in the absence of EU uniform tobacco excise tax policy.

There is sufficient evidence that the increases in tobacco excise taxes that enhance prices result in a decline in overall tobacco use (Chaloupka, Straif, & Leon, 2011). The Baltic countries ratified the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) and it entered into force for all 3 countries in 2005. The WHO FCTC Article 6

states that each Party should implement tax policies and price policies on tobacco products so as to contribute to the health objectives aimed at reducing tobacco consumption.

Cases of tobacco taxation policy in the Baltic countries were presented by the tobacco industry sponsored think tank (International Tax & Investment Center, October 2011) as an example of ineffective policies leading to growing illicit market with little revenue benefit. However, no analysis of public health effects of tobacco tax policies in the Baltic countries were found in available literature.

The aim of the paper is to explore the impact of tax policies implemented in Estonia, Latvia and Lithuania in 2000s on tobacco consumption, revenue and tobacco market.

The tasks addressed in this case study in order to evaluate effectiveness of the taxation policies in the Baltic countries after the EU accession were as follows:

1. To estimate impact of tobacco taxation policies on tobacco products prices and affordability taking into account national economic situation.
2. To estimate impact of tobacco taxation policies on tobacco smuggling both *into* and *out of* the countries.
3. To estimate tobacco excise revenue trends.
4. To estimate the impact of changes in tobacco products affordability on tobacco consumption (amount of tobacco products used in a country) and smoking prevalence (percentage of smokers among the population) in the Baltic countries.

## MATERIALS AND METHODS

Data on tobacco (cigarettes and other tobacco products) sales, tax rates, prices and tax share in retail price were taken from the European Commission database (European Commission, 2012) and reports as well as from the national statistics databases and reports.

Real (inflation and/or income adjusted) prices and tax rates were calculated using the consumer price index (CPI) data. CPI data were taken from national statistics databases for Latvia (Central Statistical Bureau of Latvia, 2012) and Lithuania (Statistics Lithuania, 2012) and Harmonized Index Consumer Price (HICP) was taken from the Eurostat (European Commission, Eurostat, 2012) site database for Estonia, as CPI for tobacco products is not available in the Estonian national statistics database.

Inflation adjusted price increases were calculated as:

$CPI_{\text{tobacco}}/CPI_{\text{all\_items}}$ , for example, if  $CPI_{\text{tobacco}}$  was 6.1% and  $CPI_{\text{all\_items}}$  was 4.4%, inflation adjusted price increase was 1.6% ( $106.1:104.4=101.6$ ). Because the Baltic countries experienced economic boom in 2002-2007 and then severe economic recession in 2008-2009 and some economic growth in 2011, to adjust tobacco prices to income changes, the tobacco affordability index was calculated as: Inflation adjusted price increase / Gross domestic product (GDP) annual change (GDP data were taken from the national statistics databases). For example, if the real GDP increase was 5.5%, inflation adjusted price increase was 1.6%, the tobacco affordability index was 3.8% ( $105.5:101.6=103.8$ ).

Data on illicit tobacco consumption were taken from the World Customs

Organization (WCO) Reports (World Customs Organization, 2004, 2008, 2010, 2012) and the KPMG Reports (KPMG, 2005, 2011, 2012), with some precautions. Recent KPMG Reports (KPMG, 2011, 2012) on tobacco consumption in the EU were commissioned by the Philip Morris International. These reports mainly use the Empty Pack Surveys (EPS) to estimate both non-domestic cigarette consumption ("inflow") and number of cigarettes, which were taxed in a country, but smoked in other countries ("outflow"). The authors of the reports admitted that such surveys have many limitations, for instance the sample is more heavily weighted towards populous, urban areas. Other researchers (Adams & Effertz, 2011) argue that the EPS study makes use of systematic misspecifications and impreciseness and thus seems to pursue the aim of showing an exaggerated high amount of illegally imported cigarettes. It is known that the tobacco industry exaggerates smuggling claims to preclude tax increases (Mackay, Eriksen, & Ross, 2012), so the industry computations on tobacco smuggling *into* the country were considered as upper estimates. For all the above mentioned indicators change over time was examined.

Smoking prevalence trends were estimated with data from bi-annual Finbalt Health surveys reports (Sippola & Sipilä, 2011), including national reports (Grabauskas et al., 2005; Grabauskas et al., 2003; Grabauskas et al., 2007; Grabauskas et al., 2011; Grabauskas et al., 2009; Pudule et al., 2003; Pudule et al., 2005; Pudule et al., 2010; Pudule et al., 2007; Tekkel & Veideman, 2011; Tekkel, Veideman, & Rahu, 2007; 2009) and Euromonitor database (Euromonitor International, 2012).

Table 1. Cigarette excise tax and VAT rates in Latvia, Estonia and Lithuania in 2002-2012 (rate increase by bold shift)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
ESTONIA	1 Jan	1 July	1 July	1 July	1 July		1 Jan	1 July	1 Jan	1 Jan	1 Jan
specific rate (kroons/1000)	150	<b>175</b>	<b>210</b>	<b>240</b>	<b>275</b>		<b>360</b>	<b>500</b>	<b>525</b>		
specific rate (euro/1000)	9,6	<b>11,2</b>	<b>13,4</b>	<b>15,3</b>	<b>17,6</b>		<b>23</b>	<b>32</b>	<b>33,55</b>	<b>38,35</b>	<b>42,18</b>
advalorem rate (%)	21	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>		<b>28</b>	<b>31</b>	<b>33</b>	<b>33</b>	33
VAT,%	18	18	18	18	18		18	<b>20</b>	20	20	20
LATVIA	1 Jan	1 Sept	1 July	1 Jan	1 Jan	1 Jan	1 Jan	1 Jan		1 Jan	1 July
specific rate (lats/1000)	5,1	<b>5,8</b>	5,8	<b>6,3</b>	<b>6,9</b>	<b>7,6</b>	<b>10</b>	<b>17,8</b>	<b>22,5</b>	22,5	<b>25</b>
specific rate (euro/1000)	9,0	<b>10,3</b>	9,8	9,7	<b>10,3</b>	<b>10,92</b>	<b>14,4</b>	<b>25,28</b>	<b>31,73</b>	31,73	<b>35,2</b>
advalorem rate (%)	0	0	<b>1,8</b>	<b>6,1</b>	<b>10,5</b>	<b>14,8</b>	<b>25</b>	<b>32</b>	<b>34,5</b>	34,5	34
VAT,%	18	18	18	18	18	18	18	18	<b>21</b>	<b>22</b>	22
LITHUANIA	1 Jan	1 Oct	1 March	1 Jan		1 July	1 Jan	1 Jan	1 March	1 Sept	1 March
specific rate (lits/1000)	32	30,2	<b>42,6</b>	<b>47,5</b>		<b>66</b>	<b>79</b>	79	<b>95</b>	<b>132</b>	<b>140</b>
specific rate (euro/1000)	8,8	8,3	<b>12,3</b>	<b>13,8</b>		<b>19,1</b>	<b>22,9</b>	22,9	<b>27,5</b>	<b>38,2</b>	<b>40</b>
advalorem rate (%)	0	<b>10</b>	10	<b>15</b>		15	<b>20</b>	20	<b>25</b>	25	25
VAT,%	18	18	18	18		18	18	19	19	<b>21</b>	21

## RESULTS

### Tax rates

All the Baltic countries started to increase tobacco excise rates prior to the EU Accession and in 2002-2004 the rates were increased several times (Table 1).

Since 2005, Latvia, which had the lowest excise yield, increased rates at least annually till 2010, while two other countries had 2.5 years periods of no tax change (Estonia: 1.07.2005-1.01.2008; Lithuania: 1.01.2005-1.07.2007). Then both countries had periods of sharp tax increases to meet the EU rules: during the 2008 Estonia increased specific rate from 275 to 500 kronas and advalorem rate from 26% to 31%. Lithuania in 2008-2009 increased specific rate from 66 to 132 lits and advalorem rate from 15% to 25%.

In 2009, all three countries increased VAT rates due to the economic recession (see Table 1).

After tax rates changes in 2004-2009, the total excise yield exceeded the EU level of 64 euro in 2009 in Estonia and Latvia and in 2010 in Lithuania. In Latvia, the yield increased almost 6-fold, in Lithuania 3.3-fold and in Estonia 2.6-fold (Figure 1).

In 2010-2011, there were no excise tax rates increases in Lithuania; Estonia had rather small increases and Latvia even slightly decreased advalorem excise rate, while increased specific excise rate and VAT.

According to the EU Council Directive 2011/64/EU, the minimum excise yield should increase to 90 euro by 1 January 2014, but all the Baltic countries were allowed a transitional period until December 31, 2017 in order to reach the requirements.

Before the EU accession, excise share in the cigarette retail price was below 50% in the Baltic countries. Total tax (excise + VAT) share was about 60%, and then it gradually increased and reached the highest level in 2008 for Estonia (92%) and Latvia (90%). In Lithuania, this proportion increased annually, but did not exceed 80%. In 2012, the total tax and excise tax proportions were respectively 84% and 68% in Estonia, 81% and 64% in Latvia and 78% and 61% in Lithuania (European Commission, 2012).

After the EU accession, the excise tax policy had similar stages in all three countries: 1) moderate tax increases in 2004-2007; 2) steep increases in 2008-2009 to meet the EU requirements; 3) minimal tax increases after the EU level was met.

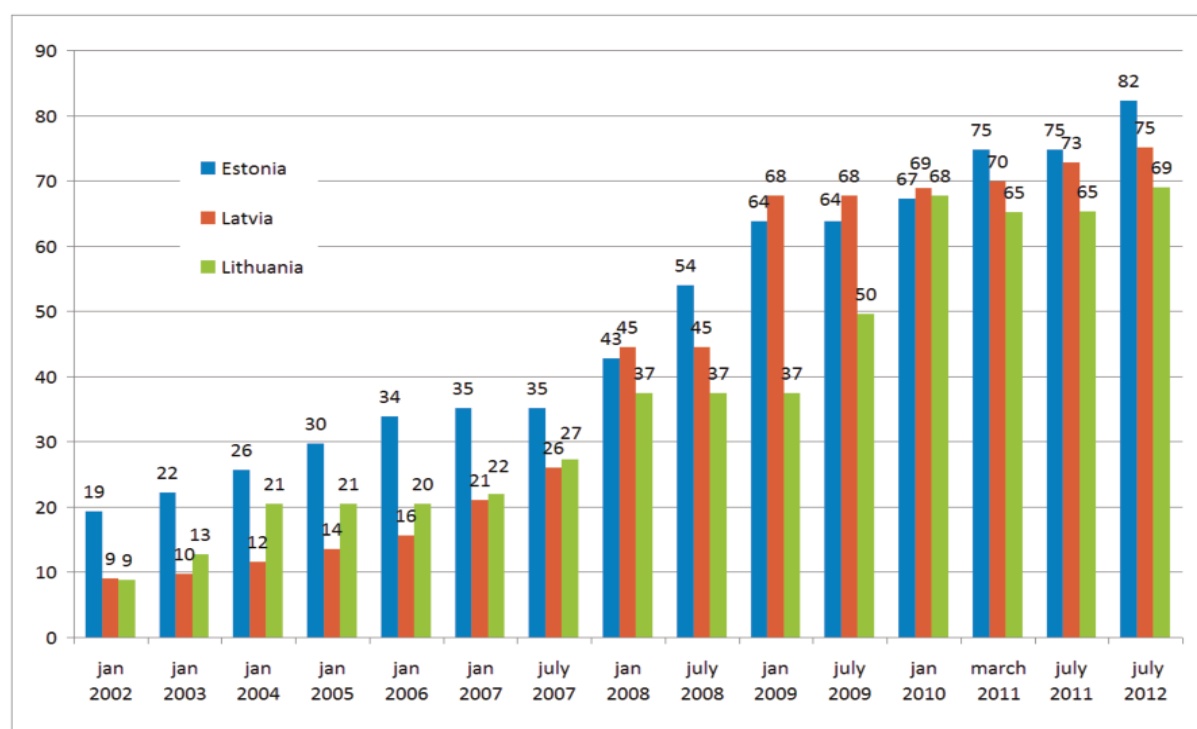


Figure 1. Average excise yield (in euro per 1000 cigarettes) in the Baltic countries in 2002-2012.

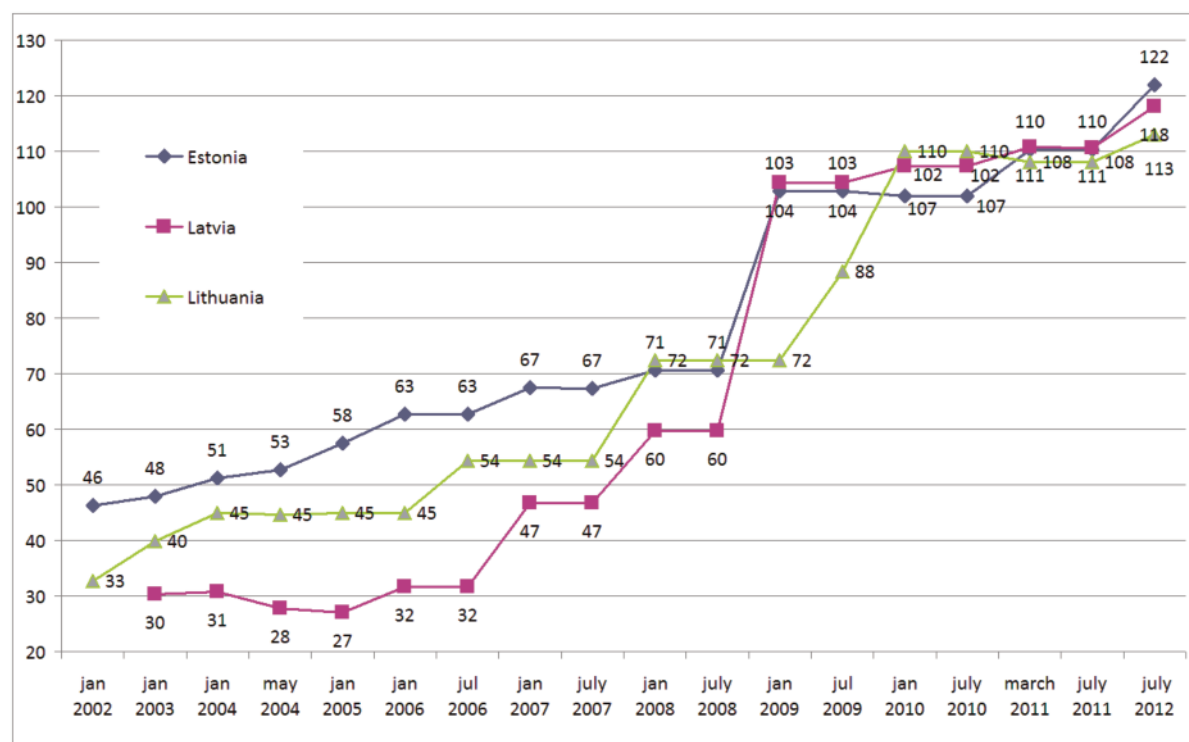


**Table 2. Price indexes, annual rates of change (%)**

<b>ESTONIA</b>	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
HICP all items	2,7	1,2	4,8	3,6	5,1	9,7	7,5	-1,9	5,4	4,1
HICP tobacco	4	9,9	10,3	4,1	5,1	1,6	50,5	0,8	9,9	9,3
Inflation adjusted tobacco price	1,3	8,6	5,2	0,5	0,0	-7,4	40,0	2,8	4,3	5,0
Real GDP change, as percent of previous year	6,6	7,8	6,3	8,9	10,1	7,5	-3,7	-14,3	2,3	7,6
Tobacco affordability index	5,3	-0,7	1,0	8,4	10,1	16,1	-31,2	-16,6	-1,9	2,5
<b>LATVIA</b>	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CPI, all goods and services	1,9	2,9	6,2	6,7	6,5	10,1	15,4	3,5	-1,1	4,4
CPI, tobacco	7,5	1,6	8,9	6,4	8	23,4	76,3	26,2	5,3	6,1
Inflation adjusted tobacco price	5,5	-1,3	2,5	-0,3	1,4	12,1	52,8	21,9	6,5	1,6
Real GDP change as percent of previous year	7,2	7,6	8,9	10,1	11,2	9,6	-3,3	-17,7	-0,9	5,5
Tobacco affordability index	1,6	9,0	6,2	10,4	9,7	-2,2	-36,7	-32,5	-6,9	3,8
<b>LITHUANIA</b>	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
CPI, all goods and services	-1,0	-1,3	2,9	3,0	4,5	8,1	8,5	1,3	3,8	3,4
CPI, tobacco	7,0	12,0	6,3	0,2	-0,2	12,3	19,4	46,4	5,1	2,7
Inflation adjusted tobacco price	8,1	13,5	3,3	-2,7	-4,5	3,9	10,0	44,5	1,3	-0,7
GDP change, as percent of previous year	6,8	10,3	7,4	7,8	7,8	9,8	2,9	-14,8	1,4	5,9
Tobacco affordability index	-1,2	-2,8	4,0	10,8	12,9	5,7	-6,5	-41,0	0,1	6,6

CPI – Consumer Price Index

HICP – Harmonized Index Consumer Price (index harmonized by the Eurostat)

**Figure 2. Nominal prices in euro per 1000 cigarettes: Most popular price category (MPPC) prices for 2002-2010; weighted average prices (WAP) for 2011-2012.**

### Prices

For cigarette prices, we also see three similar stages (Figure 2) as with tax rates: (1) moderate price increases in 2002-2007; (2) sharp rise in 2008 for Estonia and Latvia and in 2009 for Lithuania; (3) very moderate price increase over the subsequent years. It should be noted that in the EC taxation database for 2002-2010, data on the most popular price category (MPPC) were presented. Since 2011, the database displays a weighted average price (WAP) and it was very close in all three countries (about 2.2 euro per pack of 20 cigarettes).

Price changes were also estimated adjusted for inflation and GDP growth (Table 2).

For all Baltic counties, tobacco affordability increased in 2002-2007 and sharply declined in 2008-2010 due to combined effect of sharp tax hikes and economic recession. During those three years combined, the tobacco affordability index declined by 60% in Latvia, by 44% in Estonia and by 45% in Lithuania. In 2011, it started to increase again.

### Cigarette sales

For some years data on sales are not consistent and different sources provide different estimates. It should be noted that the governments provide data on tax-paid cigarettes (European Commission, 2012) and the industry sources (Euromonitor International, 2012; KPMG, 2011) provide data on actual legal retail sales. The main cause for inconsistency is forestalling, which is a release of large volumes of products immediately prior to a tax rates increase.

The forestalling impact is especially obvious for Estonia (Fig. 3a), which had large increases of tax-paid sales in 2007 and 2009, just

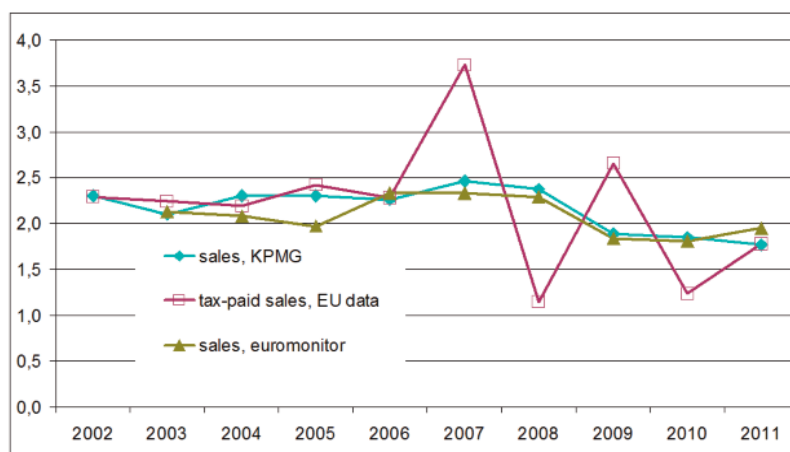


Figure 3a. Cigarette sales in Estonia in 2002-2011 (billion sticks).

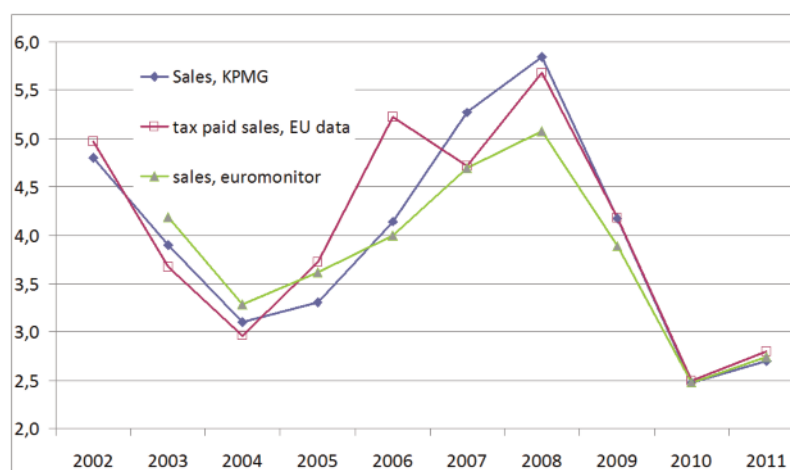


Figure 3b. Cigarette sales in Lithuania in 2002-2011 (billion sticks).

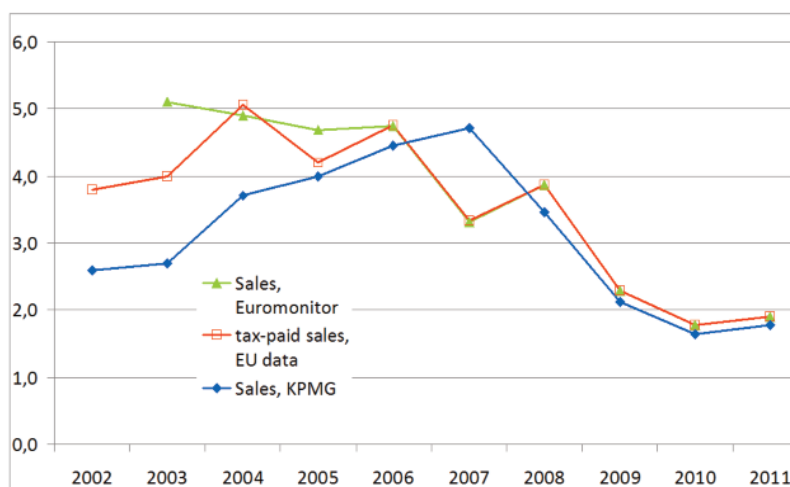


Figure 3c. Cigarette sales in Latvia in 2002-2011 (billion sticks).

before tax increases (see Table 1), and sales declines in 2008 and 2010, when tax rates were higher.

However, total sales in Estonia for 2007-2010 are almost equal for all three data sources. Retail sales had slight upward trend in 2003-2007: from about 2.1 billion cigarettes to about 2.3 billion cigarettes. Then sales declined, but since 2009 they were rather stable: about 1.8 billion a year.

In Lithuania, forestalling-driven “jumps and falls” of tax-paid sales are obvious as well (Figure 3b).

Tax hikes in Lithuania took place in 2003-2004, 2007 and 2009 (see Table 1) and tax-paid sales falls took place exactly in those years with tax-paid sales jumps in years preceding the tax increases. After large decline in 2002-2004, sales in Lithuania experienced sharp growth in 2004-2008 and even be-

came higher than in 2002. Then they declined in 2009-2010, but in 2011 sales slightly increased.

Latvia increased taxes regularly but anyway it had forestalling “jumps” in 2006 and 2008 (Figure 3c).

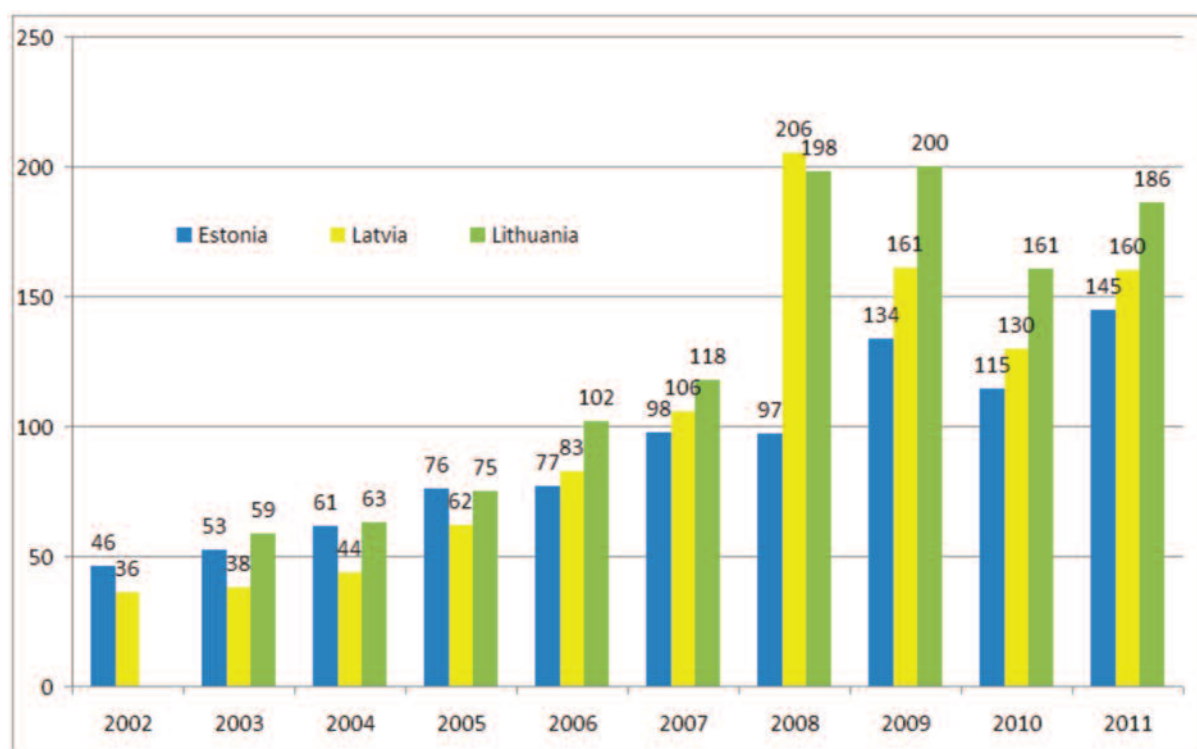
KPMG report noted (KPMG, 2005) that the governmental indicators of sales in 2002-2004 in Latvia were based on the fiscal stamps, but they did not match with the quantities per annum communicated by the tobacco industry. Moreover, the EU figures (based on the governmental reports) on quantities did not match with the duties collected taking into account the excise duty rates applicable. The estimates of the tobacco industry are far lower and show a minor volume increase from 2002 through 2004 (see Fig. 3c). Based on the industry data, there was an upward trend in tobacco sales in 2002-2007, sharp decline in 2008-2010 and small increase in 2011 (Fig. 3c).

Cigarette sales trends have common stages in all 3 countries: (1) a moderate increase in 2002-2007; (2) a sharp decline in 2008-2010; (3) a small increase in 2011. Combined annual sales for three Baltic countries were about 9-10 billion cigarettes in 2002-2005, then they increased to about 12 billion in 2007-2008 and declined to about 6 billion in 2010-2011.

## Revenues

Revenue trends in 2002-2011 were also similar for the Baltic countries (Fig. 4).

In 2003-2007, steady but slow annual increases of excise tax revenues were observed in all three countries. Revenue increased even over those years when the tax rates were not raised (see Table 1) as tax-paid sales increased (see Figures 3a-c). In 2008, Estonia substantially increased excise rates,



**Figure 4. Tobacco excise revenues (in million Euros). Data from the EC (European Commission, 2012).**



**Table 3. The economic consequences of tobacco taxation policies in the Baltic countries after the EU accession**

	Estonia			Latvia			Lithuania		
	2003	2011	Change %	2003	2011	Change %	2003	2011	Change %
Excise tax yield, euro per 1000 cigarettes	22	75	240	10	73	628	13	65	402
Cigarette price, euro per 1000	48	110	129	30	111	270	40	108	170
Real (inflation-adjusted) cigarette price, euro per 1000	48	77	61	30	68	126	40	77	91
Revenue nominal, million Euro	53	145	174	38	160	321	59	186	215
Real (inflation-adjusted) revenue, million Euro	53	102	93	38	98	157	59	132	124
Tax-paid cigarette sales, billion (KPMG data)	2,1	1,77	-16	2,7	1,8	-33	3,9	2,7	-31
Non-tax-paid cigarette sales, billion (KPMG data)	0,4	0,37	-8	0,35	0,9	157	1,5	1,18	-21
Proportion of non-tax paid cigarettes in total sales (legal consumption + outflow + inflow), %	16,0	17,3	8	11,5	33,3	190	27,8	30,4	9

but had no revenue increase due to forestalling. Instead, it had large revenue growth both in 2007 and 2009, while there were no excise increases in those two years. Sales data (Fig. 3a) explain this paradox.

Lithuania highly increased tax rate in 2009 but also had almost no revenue increase in that year due to the combined effect of forestalling and reduced affordability during the recession.

In 2008, Latvia's revenue increased almost twice due to the combined effect of forestalling and tax rate increase. Subsequently, the revenue declined in 2009.

All three countries experienced revenue decline in 2010 and revenue growth in 2011 (Fig. 4), in spite of the fact that Lithuania did not increase tax rates in 2010-2011

whereas Estonia and Latvia had very small increases of tax rates over those years (Table 1).

As with tax rates, prices and sales, the revenue trends in the Baltic countries had three stages: (1) moderate annual revenue increases in 2003-2007; (2) mixed trends in 2008-2010; (3) revenue increase in 2011. The second period was the most peculiar: while eventually each country had higher revenues in 2010 than in 2007, they experienced revenue decline in some years: Estonia in 2008 and 2010; Latvia in 2009 and 2010, and Lithuania in 2010.

Anyway, overall economic consequences of tobacco taxation policies, which were introduced in the Baltic countries after the EU accession, were rather beneficial (Table 3) as revenues increased both in nominal and real terms in

all three countries. The country with the highest tax increase (Latvia) had the largest price increase, largest revenue increase and the largest decline in sales.

### **Tobacco consumption and smuggling**

Tobacco consumption is usually measured as the number of cigarettes sold or taxed within certain time period. As it was shown above, annual tax-paid sales data may be distorted by forestalling, which is expressed in large volumes of products being released to warehouses immediately prior to a tax increase.

In some countries, when cigarette excise rates increase, some smokers switch to "other tobacco products" (OTP). According to the EC database (European Commission, 2012), amounts of fine-cut tobacco

**Table 4. Smuggling out of the Baltic countries (outflow) and smuggling into the Baltic countries (inflow) in 2006-2011, billion cigarettes, KPMG estimates**

	Outflow			Inflow			Difference			Total *
	Estonia	Latvia	Lithuania	Estonia	Latvia	Lithuania	Estonia	Latvia	Lithuania	
2002				0,3	0,4	0,8				
2003				0,4	0,35	1,5				
2004				0,4	0,35	1,4				
2005										
2006	0,65	0,82	0,9	0,55	0,53	2,4	-0,10	-0,29	1,50	5,85
2007	0,52	0,89	0,74	0,29	0,39	1,7	-0,23	-0,50	0,96	4,53
2008	0,43	0,18	1,19	0,18	0,39	1,09	-0,25	0,21	-0,10	3,46
2009	0,33	0,07	0,41	0,56	0,88	1,18	0,23	0,81	0,77	3,43
2010	0,24	0,04	0,19	0,39	1,14	1,67	0,15	1,10	1,48	3,67
2011	0,24	0,05	0,37	0,37	0,9	1,18	0,13	0,85	0,81	3,11

\* - Total illicit market (inflow + outflow) for three Baltic countries

released for consumption increased in the Baltic countries in 2004-2011. However, in 2011, the share of fine-cut tobacco in the general tobacco consumption was just 6% in Estonia, 3% in Latvia, and 2% in Lithuania. Hence, cigarette consumption is rather a good indicator of the general tobacco consumption in the Baltic countries.

Cigarette consumption may be higher than sales (if tobacco smuggling *into* the country is high) or lower (if tax-paid tobacco smuggling *out of* the country is high). Reports usually focus on the first kind of smuggling, while overlooking the second one. However, tax-paid tobacco smuggling *out of* the Baltic countries was also very high in 2000s.

According to the World Customs Organization "Customs and Tobacco Reports" (World Customs Organization, 2004, 2008, 2010, 2012), Lithuania was among the top cigarette "departure" countries in 2002-2011. In 2002-2003, average of 23 large (more than 100,000 cigarettes) seizures of Lithuanian

cigarettes were registered by the WCO annually. In 2006-2009, the annual average number of large seizures increased to 53, and then declined to 36 in 2010 and 15 in 2011. Latvia was also mentioned in the WCO reports: in 2002-2003 about 80 million Latvian cigarettes were seized (World Customs Organization, 2004). Cigarettes were also smuggled from Estonia into Finland and Sweden and the scope of smuggling had increased in years before the Estonian EU accession (Junninen & Aromaa, 2000).

According to the KPMG Project Star reports (KPMG, 2011, 2012), the "outflow" of cigarettes from the Baltic countries was rather high in 2006-2008 (Table 4).

Estonian cigarettes were mainly smuggled to Finland, while Latvian and Lithuanian cigarettes were predominantly smuggled to the UK and Ireland. In some years (Table 4), outflow was higher than inflow. Outflow could be one of the explanations of legal sales increase in 2004-2007 (See Fig. 3 a-c).

According to the KPMG estimates (KPMG, 2005, 2012), there was almost no cigarette "inflow" increase in 2006-2008 in comparison with 2002-2004 in any Baltic country (Table 4). Then inflow highly increased in 2009-2010 and declined in 2011. In 2011, the number of cigarettes smuggled into Estonia and Lithuania was almost the same as annual average numbers for 2002-2004 or 2006-2008, only in Latvia it was higher. The inflow cigarettes mainly came from Russia, Belarus (Krasovsky, 2012) and Ukraine (Ross, Stoklosa, & Krasovsky, 2012), where excise rates were much lower than in the Baltic countries.

If illicit market is estimated as sum of "inflow" and "outflow" we see downward trend of illicit market in 2006-2011 for the Baltic countries combined while taxes were increasing (Table 4).

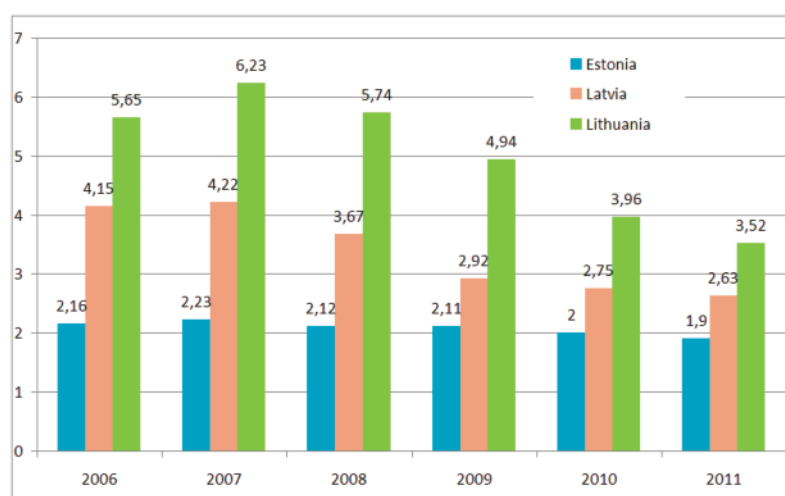
With legal cigarette sales and both cigarettes "inflow" and "outflow", KPMG (KPMG, 2012) estimated total domestic cigarettes consump-

tion (legal sales – outflow + in-flow) in 2006-2011 for each of the three Baltic countries (Figure 5).

The total consumption trends are the same for all 3 countries: a small increase in 2007 and then a decline every subsequent year. In 2007-2011, the total cigarette consumption declined by 15% in Estonia, by 38% in Latvia and by 43% in Lithuania.

In Latvia, according to the KPMG (KPMG, 2005), the annual legal sales in 2002-2005 were about 3-4 billion cigarettes, and average annual legal sales+inflow was about 4 billion cigarettes. So we can assume some increase in consumption in mid-2000s in Latvia.

In Lithuania, according to the KPMG data (KPMG, 2005), annual legal sales+inflow decreased from 5.6 billion cigarettes in 2002 to 4.5 billion cigarettes in 2004. So even



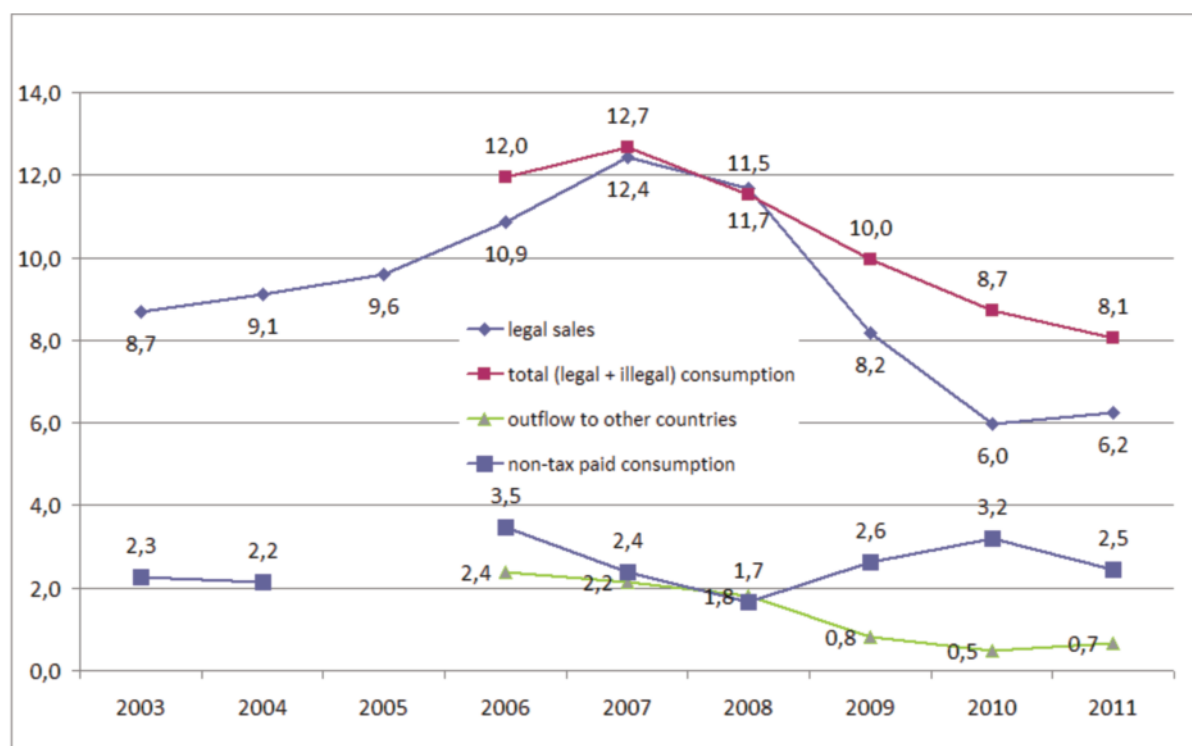
**Figure 5. Total (licit + illicit) domestic cigarette consumption in Estonia, Latvia and Lithuania in 2006-2011, billion cigarettes, KPMG estimates.**

if outflow is not taken into account, cigarette consumption increased in Lithuania in mid-2000s.

Tobacco consumption trends were similar in all the Baltic countries in

2000s: consumption slightly increased in 2002-2007 and sharply declined in 2007-2011.

This sharp consumption decline was the main factor of cigarettes sales decline in 2007-2010. Ac-



**Figure 6. Cigarette market in three Baltic countries combined in 2003-2011, billion cigarettes. KPMG reports data.**

**Table 5. Daily smoking prevalence rates**

	1998	2000	2002	2004	2006	2008	2010
Estonia - total (16-64 years old)	29,7	30,3	28,3	32,8	29,9	26,2	26,2
Estonia - male	45,1	47,9	46,3	50,6	44	41,6	36,8
Estonia - female	20,1	21,2	17,7	22,5	21,3	19,3	18,7
Latvia - total (15-64 years old)			33,2	30,1	30,4	27,9	
Latvia -male	55,7	55,5	56,4	52,2	49,5	48,4	
Latvia -female	20,9	18,8	19,9	18,5	18,1	16,1	
Lithuania - total (20-64 years old)			26,5	25	26,5	24,2	21,8
Lithuania - male	49,4	51,7	44,2	42,6	43,8	38,8	34,2
Lithuania - female	12,4	15,8	13,1	15,1	13,5	14,4	14,4

Harmonized data for 20-64 years old males and females are taken from the Finbalt Report (Sippola & Sipilä, 2011).

Non-harmonized data for total adults are taken from the national reports (Grabauskas, et al., 2005; Grabauskas, et al., 2003; Grabauskas, et al., 2007; Grabauskas, et al., 2011; Grabauskas, et al., 2009; Pudule, et al., 2003; Pudule, et al., 2005; Pudule, et al., 2010; Pudule, et al., 2007; Tekkel & Veideman, 2011; Tekkel, Veideman, & Rahu, 2007; Tekkel, et al., 2009)

cording to the KPMG estimates, legal sales in the Baltic countries combined were 12.4 billion cigarettes in 2007 and 6.0 billion in 2010 (Fig. 6).

Combined “outflow” smuggling declined from 2.2 billion to 0.5 billion cigarettes over those years. Total (legal sales minus outflow plus inflow) domestic cigarette consumption declined from 12.5 billion in 2007 to 8.7 billion cigarettes in 2010. The difference between the total domestic consumption and the legal sales equals to the difference between outflow and inflow. Sales decline in 2007-2010 in the Baltic countries combined was 6.46 billion cigarettes, but it was caused by: (1) total domestic consumption decline (3.97 billion – 61% of sales

decline); (2) reduction of the *out of* smuggling (1.68 billion – 26% of sales decline); (3) increase of the *into* cigarette smuggling in 2007-2010 by 0.82 billion cigarettes (13% of sales decline). So, increase of illicit sales within the Baltic countries was not a critical factor of sales and revenue decline.

### Smoking prevalence

Since 1990s, a collaborative project between Estonia, Finland, Latvia and Lithuania called Finbalt Health Monitor is conducted (Prättälä, Helakorpi, Sipilä, Sippola, & Sääksjärvi, 2011). The nationally representative cross-sectional postal surveys of the Finbalt Health Monitor project were carried out every second year in Estonia, Finland,

Latvia, and Lithuania. Random samples were selected from the target population defined for Estonia as those aged 16–64, for Latvia those aged 15–64 and for Lithuania those aged 20–64. All countries have followed the common protocol and procedures to conduct the survey. The response rates in the surveys varied between 51% and 80%, and decreased over the years since 2002. In 2011, the FINBALT Report was issued (Prättälä, et al., 2011) to describe trends in health behaviors, including smoking, over 1998–2008 for the 20–64-years-old respondents of the surveys.

Estonia (Tekkel & Veideman, 2011) and Lithuania (Grabauskas, et al., 2011) conducted subsequent surveys in 2010 according to the

**Table 6. Smoking prevalence rates, %. Euromonitor data**

	2005	2006	2007	2008	2009	2010	2011
Estonia	33,8	31,2	30,3	29,7	28,9	28,5	28,4
Latvia	31,0	30,6	29,9	29,2	29,0	28,2	28,1
Lithuania	31,5	30,2	29,1	28,3	26,0	23,6	23,2

same protocol, while Latvia changed the protocol. Although the 2010 smoking prevalence estimates are available for Latvia, authors of the report (Pudule et al., 2011) caution that because of the changes it is not advisable to directly compare the 2010 data with data from previous years. FINBALT surveys data on daily smoking are presented in Table 5.

In late 1990s – early 2000s, smoking prevalence rates increased in the Baltic countries, reaching the highest levels in 2000 in Lithuania, in 2002 in Latvia and in 2004 in Estonia. Then daily smoking prevalence rates decreased in all countries, the decline was the largest in 2004-2008 for Estonia, in 2006-2008 for Latvia, and in 2006-2010 for Lithuania.

Data on smoking prevalence from the Euromonitor website (Euromonitor International, 2012) are presented in Table 6.

Euromonitor does not disclose the source of the data, age groups and smoking status (daily or current smoking). Euromonitor data confirm downward smoking prevalence trend in 2005-2011 in every

Baltic country. The sharpest decline was observed in Lithuania in 2009-2010.

Smoking prevalence decline in 2006-2011 was not as high as cigarette consumption decline in Latvia and Lithuania (Table 7). Probably many smokers decreased number of cigarettes smoked during the recession, but did not quit smoking, for example, in Lithuania, proportion of daily smokers who smoked more than 15 cigarettes a day decreased from 51% in 2006 to 43% in 2010 (Grabauskas, et al., 2007; Grabauskas, et al., 2011).

Share of illicit sales in total domestic consumption (= tax-paid sales – outflow + inflow) in 2006-2011 increased only in Latvia, while in Estonia and Lithuania this share decreased (Table 6).

Change of tobacco affordability was a key factor of tobacco consumption and sales changes (Figure 7).

The graph reveals a time lag between the magnitude of change in tobacco affordability and tobacco consumption declines. In 2008-2009, the decline of affordability

was much greater than consumption decline, while in 2010-2011 consumption decline was large enough despite rather small affordability changes (Figure 7). A plausible explanation is that smokers need some time to quit smoking for good. Lower affordability can also prevent smoking initiation and new smokers only partially replace those smokers who quit or die.

## DISCUSSION

Since regaining their independence in the 1990s, the Baltic countries have been facing pressure from transnational tobacco industry, which found these countries a promising market. Tobacco industry started aggressive advertising and sophisticated marketing of tobacco products targeting mainly women and youth. At that time, smoking prevalence was high among men, but low among women, especially in Lithuania (Helasoja et al., 2006; Pudule et al., 1999).

Just before the Baltic countries joined the EU, the International Tax and Investment Centre (ITIC) claimed in its report (International

**Table 7. Tobacco consumption changes in the Baltic countries in 2006-2011**

	Estonia			Latvia			Lithuania		
	2006	2011	Change %	2006	2011	Change %	2006	2011	Change %
Total tobacco Consumption (billion cigarettes), KPMG estimates	2,16	1,9	-12,0	4,15	2,63	-36,6	5,65	3,52	-37,7
Share of illicit sales in total domestic consumption, %, KPMG estimates	25,5	19,5	-23,5	12,8	34,2	168,0	42,5	33,5	-21,1
Adult smoking prevalence, % (Euromonitor)	31,2	28,4	-9,0	30,6	28,1	-8,2	30,2	23,2	-23,2
Adult daily smoking prevalence, % (Finbalt data: 2006-2010 for Estonia and Lithuania, 2006-2008 for Latvia)	29,9	26,2	-12,4	30,4	27,9	-8,2	26,5	21,8	-17,7



Tax & Investment Center, 2003) that transition period was too short and it posed threat to government revenue as smuggling was encouraged. Recent ITIC report (International Tax & Investment Center, October 2011) claims that “*overall the EU tobacco taxation policy has created an even larger and growing EU illicit market with little revenue benefit*”. Latvian doctoral students (Strateičuks, Kaže, & Fadejeva, 2011) claimed that in Latvia “*to-bacco market is the brightest example of inefficient tax policy, completely reflecting the concept of the Laffer curve that beyond a certain rate of taxation, the increase in tax rate leads to decrease in the revenues*”.

Contrary to those claims, tobacco excise revenues in the Baltic countries increased after the EU accession, both in nominal and real terms.

The tobacco excise revenues increased every year except for the period of 2009-2010. Critics of taxation policy claimed that tax increase in those years was too high and it caused growth of illicit sales, which eventually caused revenue decline. However, the analysis of available data revealed that revenue decline in 2009-2010 was caused by the combination of the following phenomena:

1. **Income decline** caused by the **economic recession** combined with tax rates hikes greatly **decreased affordability** of tobacco products. In 2008, 2009 and 2010 combined, the tobacco affordability index on average declined by 50% in the Baltic countries. **Tobacco consumption decline** caused by the affordability decline was the main factor of tax-paid cigarettes sales decline.

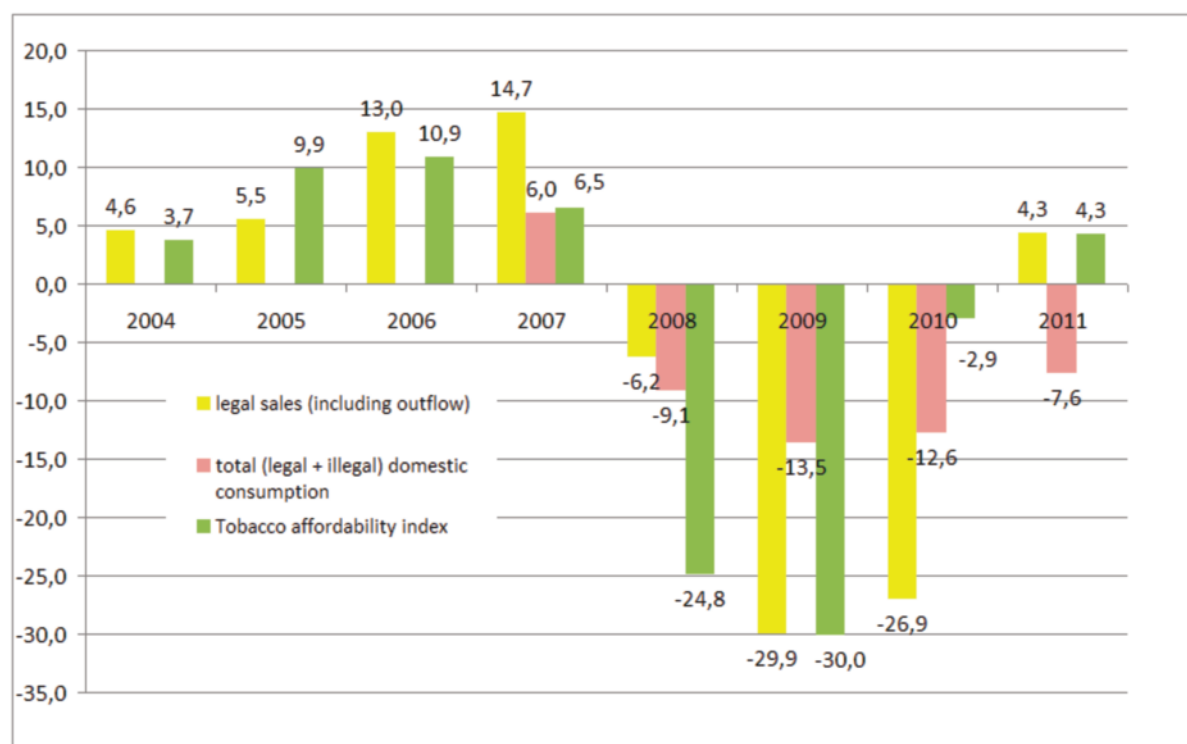
2. **VAT increase.** In 2009, all the Baltic countries increased VAT

rates. It had some impact on tobacco price increase, which caused some consumption and sales decline. Most probably, VAT revenue from tobacco products increased, but VAT-driven sales decline caused some reduction of excise revenue.

3. **Forestalling** also contributed to sales decline in 2009 in Latvia and Lithuania and in 2010 in Estonia.

4. **Decrease of cigarette smuggling out of the Baltic countries.** In 2009, “outflow” of cigarettes sharply declined in the Baltic countries and it was another factor of tax-paid sales decline.

5. **Increase of cigarette smuggling into the Baltic countries.** Increase of cigarette smuggling from Russia, Belarus and Ukraine, where the taxes and prices were lower, also contributed to the tax-paid sales decline, but impact of this factor was rather low.



**Figure 7. Annual changes (in percents) of legal sales and total domestic consumption and average tobacco affordability index in three Baltic countries combined.**

In 2010, all three countries experienced revenue decline, as sales continued to decline. There were no excise rates increases in that year in Latvia and Lithuania and only small increase in Estonia, which experienced the lowest revenue decline. The revenue decline in 2010 was mainly caused by the economic recession and could have been avoided if excise rates were highly increased. For example, in Lithuania, in 2008-2009 legal sales declined by 1.7 billion cigarettes or by 29%. However, in 2009 Lithuania had risen excise rates twice (in March and in September) and the revenue in 2009 was higher than in 2008, despite large reduction in legal sales. In 2010, legal sales further declined, mainly due to the decline in total consumption and, as there was no excise rate increase in 2010, the revenue reduced by 20%. So, contrary to the critics' opinion, in 2010 the Baltic countries experienced revenue decline not because tax hike was too high, but because there was no tax hike.

Suggestion (Strateičuks, et al., 2011) referring to the concept of the Laffer curve, which implies that beyond a certain rate of taxation, the increase in tax rate leads to decreased revenues, is not supported by available data. Estonia had the highest proportion of taxes in retail prices in 2008-2010, but the lowest decline in revenues. In 2011, the tax share in retail price was above 80% in Estonia and Latvia, and the highest ever in Lithuania (78%), but all three countries experienced revenue increase over that year.

Latvia had the highest increase of both tax yield and prices for cigarettes in 2003-2011 and it also had the highest revenue increase both in nominal and real terms. Latvia had the highest revenue increase despite the fact that it is the only country which experienced large increase in non-tax-paid cigarette

sales in 2006-2011. In Estonia and Lithuania, volumes of non-tax-paid cigarette sales declined in 2003-2011, while the proportion of these sales paradoxically increased. This phenomenon is explained by the large decline in total tobacco consumption in the Baltic countries. Tobacco industry in its media releases usually uses data on proportion of non-tax-paid cigarettes in total sales, sometimes to hide the fact that volumes of total sales decreased. Share of illicit sales could be estimated either as a proportion of total sales (including legal import, tax-paid "outflow" and non-tax-paid "inflow") or as a proportion of total domestic consumption (total sales without "outflow"). Second option gives higher figures and this is what the tobacco industry usually uses.

In 2002, the market share of illegal cigarettes in Estonia was estimated at 22-25% (Ahermaa, 2003). According to KPMG reports, it was 18% in 2003-2004 (KPMG, 2005), then increased to 25% in 2006, while in 2011 it was below 20%. For Lithuania, KPMG estimated that market share of illegal cigarettes in 2003-2006 was above 40%, while in 2011 it was 33%. Latvia had the lowest cigarette prices before the EU accession and share of illegal cigarettes in 2002-2008 was about 10% and then KPMG (KPMG, 2012) estimated that in 2009-2011 it was above 30%.

In 2003-2007, cigarette sales in the Baltic countries increased, which was partly caused by cigarette smuggling *out of* the Baltic countries, which in 2006 and in 2007 exceeded 2 billion cigarettes.

The history of contraband cigarette export indicates a regular wholesale flow from the low-price Baltic States to the Western EU countries (Markina, 2007; van Duyn, 2003).

In early 2000s, wholesale operators have turned to exporting bulk shipments of legally purchased cigarettes to Lithuania only to smuggle them back to Germany later (Von Lampe, 2002). The excise rates for tobacco remained relatively low after Estonia's accession to the European Union and the Estonian experts expected an intensification of tobacco smuggling after accession to the European Union (Saar & Markina, 2004). As we see, the expectation was true for the first years after the EU accession. Estonian customs have discovered contraband cigarettes within transport directed to Belgium, Germany, Ireland, UK, Sweden, and Norway (Markina, 2007). In 2006-2007, more than 20% of cigarettes taxed in the Baltic countries were eventually smoked in other EU countries (KPMG, 2012). However, by 2010, the excise rates in the Baltic countries exceeded the EU minimum level of 64 euro per 1,000 cigarettes. Baltic cigarettes became too expensive for large-scale bootleggers, who switched to cheaper Russian and Belorussian cigarettes. This caused huge decline of "outflow" smuggling from 2.4 billion cigarettes in 2006 to 0.5 billion cigarettes in 2010.

In early and mid 2000s, cigarettes were also smuggled from Latvia, which had the cheapest cigarettes, to other Baltic countries. In Estonia, about 30% of non-tax-paid cigarettes was from Latvia in 2006 (Markina, 2007). Since 2009, cigarette price differences in the Baltic countries are rather small and smuggling between the Baltic countries downfalls.

Contrary to the ITIC claims (International Tax & Investment Center, October 2011) that "EU tobacco taxation policy has created an even larger and growing EU illicit market", total illicit market (inflow + outflow) greatly declined in the

Baltic countries in 2006-2011 even by estimates made in the report commissioned by the Philip Morris (KPMG, 2012).

**Public health consequences** of tobacco taxation policies which were introduced in the Baltic countries after the EU accession were also rather beneficial. In 2006-2011, total (licit+ illicit) tobacco consumption greatly declined in the Baltic countries, and the decline was the largest in Latvia and Lithuania, which had higher rates of tax and price increases. The Baltic countries have also experienced smoking prevalence decline, while in Latvia and Lithuania it was smaller than the consumption decline, as some smokers just reduced number of cigarettes smoked daily after the reduction in cigarette affordability.

As tobacco consumption had some upward trend in 2004-2006, we can suggest that after the EU accession, total (licit + illicit) annual cigarette consumption declined by about 30% in both Latvia and Lithuania, and by about 10% in Estonia.

The Baltic countries also introduced some other tobacco control policies after the EU accession along with tobacco taxation. Tobacco advertising was banned. Smoke-free policies were introduced in 2006-2007. Latvia introduced pictorial health warnings in 2010. In Estonia, each county has a smoking cessation counseling clinic (World Health Organization, 2011). These policies have obviously contributed to the observed tobacco consumption decline.

Tobacco taxation policy after the EU accession had **three similar stages** in the Baltic countries.

1. In 2004-2007, tax rates and cigarette prices increased rather slowly. As Baltic counties experienced economic boom, cigarettes even

became more affordable and tobacco consumption as well as smuggling *out of* the Baltic countries were on the rise, which caused increase of tax-paid sales. Increase of tax paid sales in combination with moderate excise rates rise caused stable growth of tobacco excise revenues. The first period was beneficial in fiscal terms, but had no public health benefits.

2. In 2008-2009, the Baltic countries had to implement sharp hikes of tobacco excise rates to meet the EU requirements. By chance, it coincided with severe economic recession, and the governments also had to increase VAT rate. Income decline and rise of excise and VAT rates caused sharp decline of cigarette affordability, which led to sharp decline in tobacco consumption. Decline of tobacco consumption combined with decline of smuggling *out of* the Baltic countries and some increase of smuggling *into* the Baltic countries caused downfall of tax-paid sales. However, Estonia and Lithuania increased tobacco excise revenues even in 2009 due to tax hikes. In 2008-2009, tobacco consumption greatly declined and it was beneficial for public health, while all three countries also experienced fiscal benefits as each of them had much higher tobacco excise revenues in 2009 compared to 2007.

3. In 2010-2011, there were almost no tax rates increases and cigarette prices again increased rather slowly. As the economic recession continued in 2010, cigarette sales declined and without tax rates increases the revenues fell down. In 2011, economic situation improved, cigarettes became more affordable and tobacco sales increased. In such situation even moderate excise rise led to revenue increase.

## Lessons learnt

- In times of economic boom, moderate tax increases do not reduce tobacco affordability and do not reduce tobacco consumption. To meet public health aims in years of economic boom, excise rates should be increased rather sharply to overweight income growth.
- In times of economic recession tax hikes combined with reduced incomes substantially reduce tobacco affordability and tobacco consumption downfall. To increase tobacco excise revenue in years of economic recession, excise rates should be increased rather sharply to overweight sales decline.
- Sharp tax hike is a win-win policy in any time, while in years of economic boom it gives more fiscal benefits and in years of economic recession it provides more public health benefits.

## CONCLUSIONS

The tobacco taxation policy (in combination with other tobacco control policies) produced the following effects in three Baltic countries in 2004-2011:

1. Decline of total (licit + illicit) annual cigarette consumption by about 30% both in Latvia and Lithuania and by about 10% in Estonia.
2. Decline of adult daily smoking prevalence rates by 10-20%.
3. Decline of the *out of* country smuggling.
4. Almost no changes in volumes of smuggling *into* Lithuania and Estonia, although the market share of this kind of smuggled cigarettes increased, as the total consumption declined.

5. Three-fold increase of the annual tobacco excise revenues in three countries combined: from 164 million euro in 2004 to 473 million euro on average in 2008-2011.

Decrease of tobacco affordability caused by tax and price hikes and economic recession was a key factor of tobacco consumption decline.

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